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THE NEW WILD LIFE PRESERVE NEAR McLEAN, N. Y.

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IN the early days of Cornell University, the good field naturalists who first came upon her staff began the exploration of their environment. The lake, the hills, the gorges and the upland reaches of the streams were all examined with a view to discovering what they contained of scientific interest and of educational value. Among the many interesting spots discovered were the bogs near McLean. These cold upland bogs with their strongly marked Canadian fauna and flora early attracted attention. These miniature wastes of water and moss, like those of the far north, lying upon the border of an agricultural region, and easily accessible from the university by a 15-mile ride by rail or motor, have continued to be one of the chief centers of biological interest in the university's rich environment.

After fifty years of visitation by naturalists and collectors and by university classes in many biological subjects, after all the generations of Cornell students have tramped the bogs, probed their beds for peat and marl, tested the springiness of the hanging border of Mud Pond

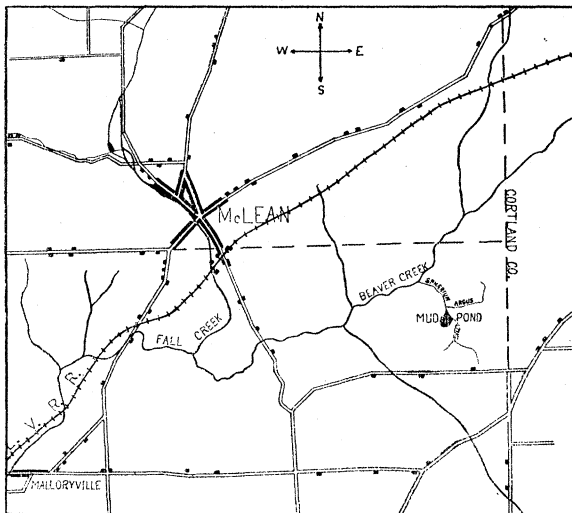


FIG. 1. MAP OF THE ENVIRONS OF THE McLEAN WILD LIFE PRESERVE. MUD POND IS WITHIN IT (SEE FIG. 2). THE CORTLAND-DRYDEN STATE HIGHWAY IS THE ONE PARALLELING ITS SOUTHERN BOUNDARY

with their weight, searched out the rare plants and animals, feasted on the wild berries, drunk from the roily springs, watched for the elusive trout in the dark waters of the meandering streams, and returned home wet and tired and heavy-laden and happy, it has come to pass that this fine bit of wild nature, instead of being "improved" and thus destroyed for the purposes of the naturalists, as have so many others, has been made a wild life preserve. Mr C. G. Lloyd of Cincinnati, himself a mycologist and an excellent field naturalist, has purchased the tract, and has given it into the keeping of the Trustees of the Lloyd Library, in order that it may be maintained in its natural state in perpetuity. An agreement has been made with the trustees of Cornell University whereby the president of the university appoints a professor from one of the biological departments to be custodian of the preserve. President Schurman designated the writer to be its first custodian.

This preserve is easily accessible from railroad station or state highway (Fig. 1), is compact, so that one may see much without traveling great distances. A survey of it was begun in the spring of 1916, by several graduate students in the Department of Entomology and Limnology in Cornell University, three of whom, J. T. Lloyd, P. W. Claassen, and R. N. Chapman, spent the Saturdays of that season in mapping with a plane table, and in collecting from the bogs. Professor A. A. Allen and Dr. C. P. Alexander also assisted in the beginning. American participation in the great world war put a stop to the work and prevented carrying out the survey plans; in the summer of 1916, Mr. Lloyd was in France and the others were scattered about in America, or devoted to more urgent tasks. Only occasional visits to take up the tag ends of the mapping, have been possible since 1916. The results thus far attained have been put together by Dr. Claassen in the accompanying map (Fig. 2).

The McLean Wild Life Preserve lies 15 miles northeast of Ithaca and one mile east of the village of McLean in the valley of Fall Creek at an elevation above the sea level of something more than 1100 feet. It lies in the lowland adjacent to an eastern tributary of Fall Creek known as Beaver Creek or Beaver Brook, and at the foot of slopes that are devoted to fields and pastures, in a region of morainal deposits of great irregularity. It is an uncultivated area of perhaps 100 acres. The basin is an irregular depression in the lowland at the foot of the slopes. It is rimmed about on the north and separated from Beaver Creek by two confluent esker-like ridges that run down from the hills like arms to inclose it. These ridges meet at the point where Sphaerium Brook has cut its way through to join Beaver Creek. The northern arm is the longer, and closely parallels Beaver Creek for the greater part of its length. Its surface is very irregular, as the contour lines on the accompanying map clearly show. Midway its length it rises steeply

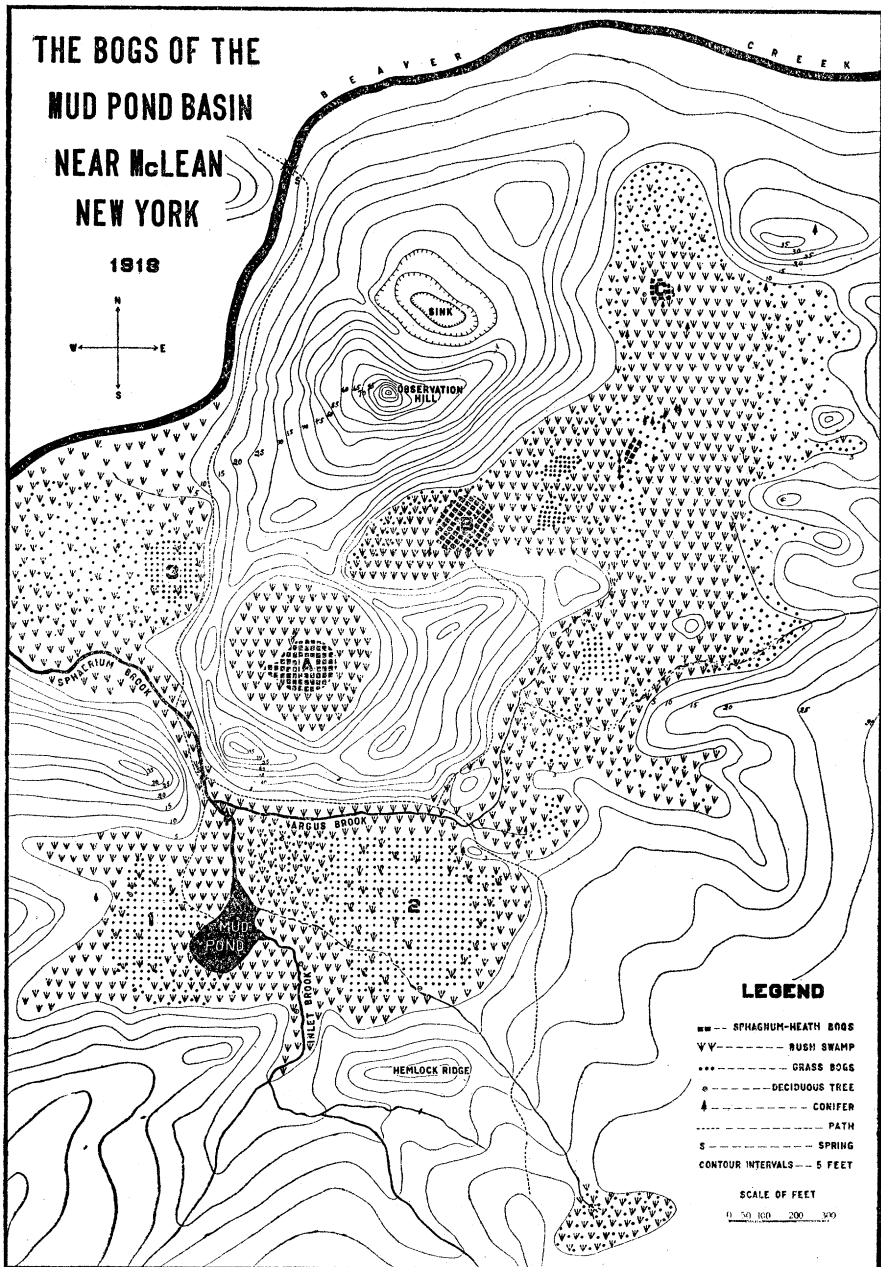


FIG. 2.—MAP OF THE MUD POND BASIN, INCLUDED WITHIN THE PRESERVE. THE WET AREAS ARE CAREFULLY SURVEYED; THE CONTOURS OF THE RIDGES ARE SKETCHED. MAP BY DR. P. W. CLAASSEN

from the bank of the creek to a height of 70 feet above the general level in a hump that is locally known as "Observation Hill." On its surface are a number of glacial potholes or sinks. One of them on the northern slope of Observation Hill is usually dry, its bottom being some ten feet above the level of the water in the Creek. Two others on the opposite side of the hill have a much greater depth, their bottom being some 30 feet below the level of the surface of the creek. These two basins are occupied by the round bogs marked A and B on the accompanying map. There were probably other similar potholes along the inner margin of this ridge, as indicated by the remnants of bog cover at the point marked C and elsewhere on the map. Bog C, especially, has still a somewhat circular outline with zonal arrangement of vegetation about its borders, and a depth of peat in the center of 25 feet.

The southern end of the longer encircling ridge declines to an elevation of about 10 feet at the southernmost round bog (A), and then rises again sharply in a short recurrent ridge some 35 feet high, that projects hook-like into the basin, dividing it into two areas that are very different in character. Northward of this hook lie all the round bogs, covered with sphagnum and heath formation; southward of the hook lie only grass bogs from which heaths are conspicuously absent.

This difference is probably due to differences in the character of the water supply. The round bogs receive only the drainage from the short forested slopes immediately surrounding them. This is soft water—practically rain water. Into the grass bogs, on the other hand, there is poured the drainage from long reaches of tilled fields, together with the outflow from numerous hardwater springs, that feed the brooks, inflowing from the eastward and southward. This is hard water. These differences are clearly indicated by a few sample determinations made by Professor E. M. Chamot of "temporary hardness" expressed in parts per million calcium carbonate.

North side of hook	Bog A	16
	Bog B	16
South side of hook	Mason's Spring	160
	East "	160
	Mud Pond at Outlet	168
At confluence, upper end of Argus Brook in bush swamp.....		36

Striking as is the difference in surface vegetation of these two areas, the difference in deposits below the surface is still more striking. It is also more significant. By probing the depths of any of the round bogs one finds their basins filled entirely with peat. There is 35 feet of it at the center of Bogs A and B, and 25 feet of it in Bog C. Similar probing in the depths of the grass bogs reveals a surface layer of peat that is underlaid by a deep deposit of marl. At the edge of Mud Pond there is some 11 feet of peat overlying 24 feet of marl.

Probably when the glacier finally retreated from this region to the northward, leaving morainal deposits encircling the basin substantially as they yet remain, the entire basin was filled with water, and the shores of the primeval Mud Pond were approximately coincident with the innermost contours of our map. It had then more than fifty times its present area of open water. It was irregular in outline, somewhat narrowed in the middle portion, curving to northward beyond this, with a westwardly directed bay that was confluent with the pothole now occupied by round Bog B. Detached but adjacent to this was a small round open pond in the pothole now occupied by Bog A.

Then the filling began, and also the cutting down of the outflow channel by Sphaerium Brook. Both processes may have gone on rather rapidly by erosion for a little while, until the soil was firmly held by a complete ground-cover of vegetation. That there has been no very extensive cutting down of the outlet is indicated by three facts: the gradient is slight, the catchment area is small and the flow always limited, and the channel is bedded with cobble stones for the most part, too heavy for so slight a stream to move.

The filling of the pond has been mainly the work of aquatic plants. Those growing about the shore line and on the bottom have contributed their remains in the form of peat and marl, pushing ever farther and farther into open water and adding ever to the deposits, until all that remains open at the present day is a shallow basin 100 feet across. This is the present Mud Pond; and it is filling so rapidly that at the present rate it will be soon, perhaps in less than another half century, entirely overgrown.

Outside the Mud Pond basin, our map shows another grass bog lying in the angle between Sphaerium Brook and Beaver Creek. Though superficially similar to the other grass bogs this one is different in origin. This one was formed originally behind a beaver dam that crossed Beaver Creek some distance below its confluence with Sphaerium Brook. It appears to be maintained at the present time as the upbuilding process goes on, by flood time accretions of silts, deposited along the bank of Beaver Creek. It is everywhere shallow, its depth where samplings have been made not being greater than 8 or 9 feet. It is composed of impure peat, in which from top to bottom there is a goodly mixture of woody stems, of the average size of alder stems. Apparently this bog has been little changed throughout its history. It was formed upon the level flood plain of the creek by damming, the work being done at first by beavers, and later by the natural leveeing of the creek with increase of soil wash from surrounding farms.

The bottom of Mud Pond basin as a whole remains as yet unexplored. Random probings with a marl-sampler have been made in

all the bogs and a few lines of soundings have been run across the grass bogs adjacent to the present pond. These seem to show in the buried contours a row of roundish potholes on the north and a single much larger and somewhat deeper basin on the south. These are connected by a shallower, valley-like depression lying between. These are the two major divisions of the basin, as already indicated, differing in the nature of their catchment areas and water supply; differing strikingly in their plant and animal life, and in the consequent bottom deposits.

The round bogs were once doubtless open circular ponds. They are now completely overgrown. Bogs A, B and C are very similar, though the filling of C is a little more advanced. Each has a central area of dense low-growing sphagnum and heath, surrounded by two zones of larger woody plants. First is a narrow zone of shrubs, and second a wide zone of water loving trees—yellow birch, red maple, black ash, etc.—extending to the foot of the slope. The latter zone is now a cut-over area, studded with stumps of trees only, among which the shrubbery of the first zone, tall ferns and other shade plants, brambles and other immigrants are all struggling lustily for place and standing room. A few scattering worthless trees remain, having escaped the axe.

The more shoal areas of the remainder of the basin, and all the principal areas of silt deposition, whether originally shallow or not, are covered with bush swamp, the dominant species in which is the speckled alder. This alder grows luxuriantly along the silt-strewn edges of all the brooks and about the borders of Mud Pond. Under its shadow in the wetter places grow acres of marsh marigold and skunk cabbage interspersed with swamp saxifrage, and in the plashy edges of the interrupted streamlets, the spreading *Chrysosplenium*. The alder grows in spreading clumps of usually 4 to 8 strong stems, which gather fallen twigs and leafage about their bases, and thus build up miniature islets in the swamp. On the summit of these such plants as meadowrue and marsh fern and bedstraw and red raspberry find lodgment. The older outer stems of the alder clumps, being loosely anchored in the mud, are borne down to the ground by the heavy ice-coats of winter, and new shoots from the center of the clump arise in their stead. Thus the holding unit is maintained. The alder is the most important plant in the later stages of land building in the basin.

The grass bogs are far less uniform in the character of their vegetation than are the round bogs. Their meadow-like appearance is due to the dominance in them of several species of tussock forming grasses and sedges. These species are of local and irregular distribution, and rarely occur in anything like a pure stand. Where the tussocks are highest—often knee height or higher, so that walking among them is

no easy matter—their height is increased by at least two animal agencies; the ants of the marsh build their nests in the top of the tussocks, and in so doing heap up much material on their summits; the meadow mice excavate runways in the bottom of the narrow channel between the tussocks and eat new shoots springing from severed stems, and thus they deepen the narrow lanes between the tussocks.

The grass bogs lack the heaths of the round bogs, but they contain areas having a considerable admixture of sphagnum with here and there an overgrowth of cranberries. There are marsh ferns also in plenty; and in a wet spot in the largest one, a bit of cattail has obtained a foothold. The edges of all the grass bogs are being invaded by alder.

The filling of the basin is well nigh completed. The work of the plants has been supplemented and accelerated in recent times by human interference. Only one small and shallow pond remains open water and that is rapidly filling up with silt. The grass bogs are merely the openings in the herbaceous bog-cover that are not yet overgrown by alder or other shrub. The largest of these are the two that lie in the southern part of the basin. They are situated on either side of the pond but separated from it and from each other by the shore-bordering alders. A line of probings through the surface peat extending across the middle of the largest grass bogs from north to south at 50 feet intervals gave depths as follows: 5-15-17-19-18-17-18-17-17-3 feet of peat. The depth of the underlying marl was not determined. A single probing of the bed of the larger grass bog in the bush swamp above the surface of Argus Brook at its northeast corner revealed a depth of 18 feet of surface peat. It is altogether probable that a systematic sampling of the deposits of the whole of the whole basin, with careful examination and comparison of the samples, would reveal much of the actual history of the filling process.

The Preserve is being inclosed with a high fence, that will keep browsing farm animals outside. Stiles will be built over the fence at convenient points of access, and one principal encircling path through the woods about the borders of the basin will be kept open. Signs inviting naturalists to enter for study, but not for destruction, will be placed beside the stiles and another guide sign to motorists will be placed at the north side of the state road that runs between Cortland and Dryden a quarter of a mile to the southward. This Preserve is open to all naturalists and all are welcome to visit it.